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# Vivid Vision Therapy Guide



This guide is to provide specific information to help you guide patients with binocular vision disorders through therapy. We also recommend utilizing resources and educational programs provided by organizations such as the Optometric Extension Program Foundation (OEP), the College of Optometrists in Vision Development (COVD), the Australasian College of Behavioural Optometry (ACBO), and the British Association of Behavioural Optometry (BABO).

## Indication Statement

Vivid Vision is a computer based application with data tracking and analysis tools. The device is intended to identify strabismus (eye muscle imbalance), to assess binocular vision (use of both eyes to see), to treat suppression and amblyopia (dimness of vision without any apparent disease of the eye), and to treat problems of vergence (inability to direct the two eyes at the same location).

## Notice

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## WHAT IS VIVID VISION

### Our Mission

To provide the most advanced vision care platform through immersive Virtual Reality (VR), which consists of applications for amblyopia, vergence disorders, and strabismus. Through these applications, and the aid of natural hand gestures through game play, Vivid Vision is creating a monocular fixation in a binocular field (MFBF), also known as dichoptic, experience through VR. These methods work to break suppression and maintain binocular fusion to aide in the improvement of binocular vision.



# Convergence Insufficiency/ Convergence Excess Curriculum

Week 1 - 4

## Introduce VV Hoopie

Work on convergence, pursuits, and visual memory with Hoopie.

### Hoopie

#### Settings

##### Difficulty Mode

Easy - Medium - Hard - Master - Custom

The selection of difficulty mode will adjust the target radius and shot interval to increase difficulty

##### Dichoptic Mode

**Disable** Dichoptic Mode

##### Tach Mode

Decrease the marker size and/or tach duration to make the activity more difficult

##### Occlusion/Blur

These settings are often not required but may be adjusted to help break suppression.

## Introduce VV Step Vergence

Work on fusional reserves with the Step Vergence activity. The goal is to have the patient reach greater than 30 prism diopters on base-out and 25 prism diopters on base-in.

## Step Vergence

### Settings

#### Direction

Select **BI** for divergence or **BO** for convergence

#### Starting Point

Begin activity at selected starting vergence demand, either at 0/ortho or at a chosen vergence demand

#### Vergence Limit

Set the limit for ending vergence demand

#### Step Size

0.5 for easy difficulty. Increasing the step size in diopters will increase the difficulty

#### Activity Length

Increase total time to encourage stamina of binocular fusion

#### Answer Time Limit

As the patient improves, add a time limit to work on automaticity

## Binocular Thinking Skills

Utilizing standard Vision Therapy protocols that encompass both monocular/binocular exercises. The following may contain few or listed exercises for in office or home therapy programs.

- Marsden Ball Convergence, Physiological Diplopia, Squinchel, Pencil Push-ups/Back-ups, Pencil Jumps

## Oculomotor Thinking Skills - Monocular/Binocular Eye Movements

Utilizing standard Vision Therapy protocols that encompass both monocular/binocular smooth eye movements. The eye movements exercises introduce the use of pursuits, saccades, and fixations. The following may contain few or listed exercises for in office or home therapy programs.

- Thumb Rotations, Eye Control, Coin Circles, Various Hart Chart Activities

## General Movement Thinking Skills

Utilizing standard Vision Therapy protocols that encompass gross motor skills. The following may contain few or listed exercises for in office or home therapy programs.

- Chalkboard Circles, Balance Activities, Walking Rail, Randolph Shuffle, Slap Tap, Angels In the Snow

## Week 5 - 8

### Continue to work VV Hoopie and Step Vergence Activity

Adjust settings in both of these games to increase difficulty. Start adding BO virtual prism in Hoopie to stimulate more convergence.

### Introduce VV Barnyard Bounce game

Work on fusional reserves with Barnyard Bounce. The goal is to have the patient reach greater than 30 prism diopters on base-out and 25 prism diopters on base-in.

### Barnyard Bounce

#### Settings

##### Direction

Select **BI** for divergence or **BO** for convergence

##### Difficulty Mode

Easy - Medium - Hard - Master - Custom

This will set the jumping platforms at various levels of difficulty

##### Starting Vergence

Begin game at selected starting vergence demand

##### Ending Vergence

Set the limit for ending vergence demand

##### Step Size

0.5 for easy difficulty. Increasing the step size in diopters will increase the difficulty

##### Activity Length

Increase total time to encourage stamina of binocular fusion

### Binocular Thinking Skills

Utilizing standard Vision Therapy protocols that encompass both monocular/binocular exercises. The following may contain previous or listed exercises for in office or home therapy programs.

- Brock String Activities, See Three Coins, Lifesaver Cards, Overlapping Pictures, Quoit Vectogram

## Oculomotor Thinking Skills - Monocular/Binocular Eye Movements

Utilizing standard Vision Therapy protocols that encompass both monocular/binocular smooth eye movements. The eye movements exercises introduce the use of pursuits, saccades, and fixations. The following may contain previous or listed exercises for in office or home therapy programs.

- ❑ Various Hart Chart Activities, Star Tracing, McDonald Chart, Pegboard Rotator, Rotating Tee's

## General Movement Thinking Skills

Utilizing standard Vision Therapy protocols that encompass gross motor skills. The following may contain previous or listed exercises for in office or home therapy programs.

- ❑ Chalkboard Circles, Balance Activities, Walking Rail, Randolph Shuffle, Slap Tap, Angels In the Snow

## Week 9 - 16

Continue to work Vergence Activity and Barnyard Bounce game as needed

### Introduce Jump Duction Activity/Turbo Game

Work on fusional reserves with the Jump Duction activity. Jump Duction is more challenging than the Vergence activity, the patient is going back to orthophoria before increasing the vergence demand. The overall game goal is to have the patient reach greater than 30 prism diopters on base-out and 25 prism diopters on base-in.

### Jump Duction

#### Settings

##### Direction

Select **BI** for divergence or **BO** for convergence. **BI/BO** is the more advance level

##### Starting Point

Begin activity at selected starting vergence demand

##### Vergence Limit

Set the limit for ending vergence demand

##### Step Size

0.5 for easy difficulty. Increasing the step size will increase the difficulty

##### Answer Time Limit

As the patient improves, add a time limit to work on automaticity



## Turbo - Peripheral Vision

Work on the peripheral vision by playing the Turbo game. The patient can play with Headlock checked or unchecked. Headlock checked, the patient is instructed to keep their head on the green circle. As the target lights up, they are to use their eyes to fixate on the object then touch it.

### Settings

#### Difficulty Mode

Easy - Medium - Hard - Master - Custom

The amount of targets rendered will rely on settings.

#### Headlock

Enable headlock. Large size makes the activity easier. Medium is moderate difficulty. Small is high difficulty

## Turbo - Saccades

Work on saccadic eye movements by playing the Turbo game. The patient can play with Headlock checked or unchecked. Headlock checked, the patient is instructed to keep their head on the green circle. As the target lights up, they are to use their eyes to fixate on the object then touch it.

### Settings

#### Difficulty Mode

Easy - Medium - Hard - Master - Custom

The amount of targets rendered will rely on settings.

#### Headlock

Enable headlock. Large size makes the activity easier. Medium is moderate difficulty. Small is high difficulty.

## Turbo - Sequential Memory

Work on sequential memory by playing the Turbo game. The patient can play with Headlock checked or unchecked. Headlock checked, the patient is instructed to keep their head on the green circle. As the target lights up, they are to use their eyes to fixate on the object then touch it.

### Settings

#### Difficulty Mode

Easy - Medium - Hard - Master - Custom

The amount of targets rendered will rely on settings.

### **Headlock**

Enable headlock. Large size makes the activity easier. Medium is moderate difficulty. Small is high difficulty.

### Binocular Thinking Skills

Utilizing standard Vision Therapy protocols that encompass both monocular/binocular exercises. The following may contain previous or listed exercises for in office or home therapy programs.

- ❑ Opac/Clear Lifesaver Cards, Overlapping Pictures, Vectogram, Vectogram Jump Duction, Cheiroscope Training, Aperture Rule Trainer

### Oculomotor Thinking Skills - Binocular Eye Movements

Utilizing standard Vision Therapy protocols that encompass both monocular/binocular smooth eye movements. The eye movements exercises introduce the use of pursuits, saccades, and fixations. The following may contain previous or listed exercises for in office or home therapy programs.

- ❑ Various Hart Chart Activities, Rotating Tee's, Wayne Saccadic Fixator

### General Movement Thinking Skills -

Utilizing standard Vision Therapy protocols that encompass gross motor skills. The following may contain previous or listed exercises for in office or home therapy programs.

- ❑ Chalkboard Circles, Balance Activities, Walking Rail, Randolph Shuffle, Slap Tap, Angels In the Snow



# Amblyopia/Strabismus Curriculum

## Week 1 - 2

When the patient is ready, introduce Vivid Vision at the beginning of a vision therapy session. This gives the patient ability to break suppression and work stereopsis in a successful VR environment. The first month of vision therapy, two anti-suppression games and a small introduction to Bubbles is suggested.

### Introduce VV Hoopie/Breaker and Bubbles

#### Hoopie

Work on anti-suppression with Hoopie.

#### **Settings**

##### **Dominant Eye**

Set the correct dominant eye. This is normally the non-amblyopia/strabismus eye.

##### **Horizontal/Vertical Deviation**

For a refractive amblyopic patient, you can typically set both values to 0. For a strabismic patient, enter start at their angle of deviation either based on the clinical findings or our angles test. Slowly decrease the amount of deviation (closer to 0). It is recommended to decrease the value by 0.5 prism diopters every 1-2 minutes.

##### **Difficulty Mode**

##### **Easy - Medium - Hard - Master - Custom**

The selection of difficulty mode will adjust the target radius and shot interval to increase difficulty

##### **Dichoptic Mode**

Enable Dichoptic Mode. Tach mode is enabled as the anti - suppression marker. The O's and X's are presented to the non dominant eye.

**Tach Mode**

Enable Tach Mode to make the game more difficult or as the marker to break suppression. The patient identify the marker. Catch the O's and if it is an X, dodge it. Decreasing the marker size and/or duration will make the activity more difficult. A shorter duration (under 1 second) is helpful for alternating strabismus.

**Contrast Ratio**

A 50% contrast is suggested at the start of therapy. High contrast appears in nondom eye.

**Occlusion/Blur**

These settings may be adjusted to help break suppression.

## Breaker

Work on anti-suppression with Breaker.

**Settings****Dominant Eye**

Set the correct dominant eye. This is normally the non-amblyopia/strabismus eye.

**Horizontal/Vertical Deviation**

For a refractive amblyopic patient, you can typically set both values to 0. For a strabismic patient, enter start at their angle of deviation either based on the clinical findings or our angles test. Slowly decrease the amount of deviation (closer to 0). It is recommended to decrease the value by 0.5 prism diopters every 1-2 minutes

**Difficulty Mode**

**Easy - Medium - Hard - Master - Custom**

The selection of difficulty mode will adjust the target speed and amount of bricks to increase difficulty

**Ball Size**

If the patient has a difficult time seeing the ball, increase the ball size. Start at a point where they can see it, then slowly decrease the size to make it more difficult.

**Contrast Ratio**

A 50% contrast is suggested at the start of therapy. High contrast appears in nondom eye.

**Occlusion/Blur**

These settings may be adjusted to help break suppression.

## Bubbles

Bubbles will work on Stereopsis. Note that if the patient cannot get past level 2, they are likely not seeing stereopsis. Continue the game for an additional 2 minutes. If they are still struggling, discontinue it and try again next session.

**Settings****Difficulty Mode**

**Easy - Medium - Hard - Master - Custom**

Difficulty mode will adjust the size of the bubble to increase difficulty

#### **Location**

**Central - Mid Peripheral - Peripheral**

Bubble location at different points in view

#### **Disparity**

The game automatically decrease the disparity as they progress to the next level. You can manually decrease the disparity.

## Monocular Tracking

Utilizing standard Vision Therapy protocols that encompass monocular exercises. The following may contain few or listed exercises for in office or home therapy programs. There is an importance to attempting to gain equal or almost equal performance out of both eyes individually in order to promote binocular function.

- Marsden Ball, Thumb Pursuits/Saccades

## Vergence

The patient may have instability to convergence or divergence due to suppression when they start at week 1-2. The patient will need to overcome the suppression scotoma prior to being able to maintain fusion lock at a given distance. In the early sessions of therapy, you'll want to determine if the patient is constantly suppressing or alternating suppression between the two eyes.

## General Movement Thinking Skills

Utilizing standard Vision Therapy protocols that encompass gross motor skills. The following may contain few or listed exercises for in office or home therapy programs.

- Chalkboard Circles, Balance Activities, Walking Rail, Randolph Shuffle, Slap Tap, Angels In the Snow

## Week 3 - 4

When the patient is ready, introduce Vivid Vision at the beginning of a vision therapy session.

**Continue with VV Hoopie/Breaker and Bubbles**

**\*Add Bubbles if the patient can achieve stereopsis in Bubbles game**

## Hoopie

Work on anti-suppression with Hoopie.

### Settings

#### Dominant Eye

Set the correct dominant eye. This is normally the non-amblyopia/strabismus eye.

#### Horizontal/Vertical Deviation

For a refractive amblyopic patient, you can typically set both values to 0. For a strabismic patient, enter start at their angle of deviation either based on the clinical findings or our angles test. Slowly decrease the amount of deviation (closer to 0). It is recommended to decrease the value by 0.5 prism diopters every 1-2 minutes.

#### Difficulty Mode

##### Easy - Medium - Hard - Master - Custom

The selection of difficulty mode will adjust the target radius and shot interval to increase difficulty

#### Dichoptic Mode

Enable Dichoptic Mode. Tach mode is enabled as the anti - suppression marker. The O's and X's are presented to the non dominant eye.

#### Tach Mode

Enable Tach Mode to make the game more difficult or as the marker to break suppression. The patient must now identify the marker. If it is an X, they want to dodge it. Decreasing the marker size and/or duration will make the activity more difficult. A shorter duration (under 1 second) is helpful for alternating strabismus.

#### Contrast Ratio

A 50% contrast is suggested at the start of therapy. High contrast appears in nondom eye.

#### Occlusion/Blur

These settings may be adjusted to help break suppression.

## Breaker

Work on anti-suppression with Breaker.

### Settings

#### Dominant Eye

Set the correct dominant eye. This is normally the non-amblyopia/strabismus eye.

#### Horizontal/Vertical Deviation

For a refractive amblyopic patient, you can typically set both values to 0. For a strabismic patient, enter start at their angle of deviation either based on the clinical findings or our angles test. Slowly decrease the amount of deviation (closer to 0). It is recommended to decrease the value by 0.5 prism diopters every 1-2 minutes

### **Difficulty Mode**

**Easy - Medium - Hard - Master - Custom**

The selection of difficulty mode will adjust the target speed and amount of bricks to increase difficulty

### **Ball Size**

If the patient has a difficult time seeing the ball, increase the ball size. Start at a point where they can see it, then slowly decrease the size to make it more difficult.

### **Contrast Ratio**

A 50% contrast is suggested at the start of therapy. High contrast appears in nondom eye.

### **Occlusion/Blur**

These settings may be adjusted to help break suppression.

## **Bubbles**

Bubbles will work on Stereopsis. Note that if the patient cannot get past level 2, they are likely not seeing stereopsis. Continue the game for an additional 2 minutes. If they are still struggling, discontinue it and try again next session.

### **Settings**

#### **Difficulty Mode**

**Easy - Medium - Hard - Master - Custom**

Difficulty mode will adjust the size of the bubble to increase difficulty

#### **Location**

**Central - Mid Peripheral - Peripheral**

Bubble location at different points in view

#### **Disparity**

The game automatically decrease the disparity as they progress to the next level. You can manually decrease the disparity.

## **Monocular Tracking**

Utilizing standard Vision Therapy protocols that encompass monocular exercises. There is an importance to attempting to gain equal or almost equal performance out of both eyes individually in order to promote binocular function. The following may contain few or listed exercises for in office or home therapy programs.

- Marsden Ball, Thumb Pursuits/Saccades

## **Vergence**

At this point in therapy the patient is not likely to have the ability to converge or diverge as they are most likely suppressing outside of Vivid Vision in the early weeks of Vision Therapy. The patient will need to overcome suppression scotoma prior to being able to verge at a given distance. In the early sessions of therapy, you'll want to determine if the patient is constantly suppressing or alternating suppression between the two eyes.

## Monocular Accommodation

The patient is likely to have reduced accommodative facility between the two eyes. It is important to work on accommodation monocularly before you work into binocular accommodation. The following may contain few or listed exercises for in office or home therapy programs.

- ☐ Hart Chart, Bullseye Card

## Week 5 - 8

Introduce Vivid Vision at the beginning of a vision therapy session.

**Continue with VV Hoopie/Breaker/Bubbles and or Introduce VV Ring Runner**

**\*Add Bubbles if the patient can achieve stereopsis in Bubbles game.**

Introducing a new game or changing a game at this point will keep the activities fresh and introduce a new game to work breaking suppression at distance to near in Ring Runner. Use discretion to add or remove games.

## Ring Runner

Work on anti-suppression with Ring Runner.

### Settings

#### Dominant Eye

Set the correct dominant eye. This is normally the non-amblyopia/strabismus eye.

#### Horizontal/Vertical Deviation

For a refractive amblyopic patient, you can typically set both values to 0. For a strabismic patient, enter start at their angle of deviation either based on the clinical findings or our angles test. Slowly decrease the amount of deviation (closer to 0). It is recommended to decrease the value by 0.5 prism diopters every 1-2 minutes.

#### Difficulty Mode

**Easy - Medium - Hard - Master - Custom**

The selection of difficulty mode will adjust the target radius and shot interval to increase difficulty

#### Icon Size

If the patient has a difficult time seeing the markers inside of the white ring, increase the icon size. Start at a point where they can see it, then slowly decrease the size to make it more difficult.

#### Contrast Ratio

A 50% contrast is suggested at the start of therapy. High contrast appears in nondom eye.



### **Occlusion/Blur**

If the patient has a difficult time seeing the markers inside of the white ring with the icon size at maximum value, slowly increase the contrast ratio. If the patient still have a difficult time at maximum contrast, introduce blur. Once the baseline values are figured out (deviation, icon size, contrast ratio, and blur), slowly remove the help.

## Monocular Tracking

Utilizing standard Vision Therapy protocols that encompass monocular exercises. There is an importance to attempting to gain equal or almost equal performance out of both eyes individually in order to promote Binocular function. The following may contain few or listed exercises for in office or home therapy programs.

- ❑ Marsden Ball, Thumb Pursuits/Saccades

## Vergence

At this point in therapy the patient is not likely to have the ability to converge or diverge as they are most likely suppressing outside of Vivid Vision in the early weeks of Vision Therapy. The patient will need to overcome suppression scotoma prior to being able to verge at a given distance. In the early sessions of therapy, you'll want to determine if the patient is constantly suppressing or alternating suppression between the two eyes.

## Monocular Accommodation

The patient is likely to have reduced accommodative facility between the two eyes. It is important to work on Accommodation monocularly before you work into Binocular Accommodation. The following may contain few or listed exercises for in office or home therapy programs.

- ❑ Hart Chart, Bullseye Card, Mental Minus

## Week 8 - 10

### Continue with VV Hoopie/Breaker/Ring Runner/Bubbles and or Introduce Pepper Picker and Turbo

Introducing a new game or changing a game at this point will keep the activities fresh and also introduce a new game to assist in breaking suppression. Use Discretion to add or remove games.

### Pepper Picker

This activity works on Visual Figure Ground, Form Constancy, and anti-suppression.

#### **Settings**

##### **Dominant Eye**

Set the correct dominant eye. This is normally the non-amblyopia/strabismus eye.

### **Horizontal/Vertical Deviation**

For a refractive amblyopic patient, you can typically set both values to 0. For a strabismic patient, enter start at their angle of deviation either based on the clinical findings or our angles test. Slowly decrease the amount of deviation (closer to 0). It is recommended to decrease the value by 0.5 prism diopters every 1-2 minutes.

### **Difficulty Mode**

**Easy - Medium - Hard - Master - Custom**

The selection of difficulty mode will adjust the size/number of the produce to pick to increase difficulty

### **Dichoptic Mode**

Disable dichoptic mode for easy difficult. Enable for high difficulty.

### **Produce Size**

Decreasing the produce size will make the game more difficult. Produce size of 1.6 is easy difficult, 1.2 is moderate difficulty, and 0.8 is high difficulty.

### **Contrast Ratio**

A 50% contrast is suggested at the start of therapy. This will add high contrast to the non dominant eye and decrease in the dominant eye.

### **Occlusion/Blur**

If the patient has a difficult time seeing the markers inside of the white ring with the icon size at maximum value, slowly increase the contrast ratio. If the patient still have a difficult time at maximum contrast, introduce blur. Once the baseline values are figured out (deviation, icon size, contrast ratio, and blur), slowly remove the help.

## **Turbo - Peripheral Vision**

Work on the peripheral vision by playing the Turbo game. The patient can play with Headlock checked or unchecked. Headlock checked, the patient is instructed to keep their head on the green circle. As the target lights up, they are to use their eyes to fixate on the object then touch it.

### **Settings**

#### **Difficulty Mode**

**Easy - Medium - Hard - Master - Custom**

The amount of targets rendered will rely on settings.

#### **Headlock**

Enable headlock. Large size makes the activity easier. Medium is moderate difficulty. Small is high difficulty

## Turbo - Saccades

Work on saccadic eye movements by playing the Turbo game. The patient can play with Headlock checked or unchecked. Headlock checked, the patient is instructed to keep their head on the green circle. As the target lights up, they are to use their eyes to fixate on the object then touch it.

### Settings

#### Difficulty Mode

Easy - Medium - Hard - Master - Custom

The amount of targets rendered will rely on settings.

### Headlock

Large size makes the activity easier. Medium is moderate difficulty. Small is high difficulty.

## Turbo - Sequential Memory

Work on sequential memory by playing the Turbo game. The patient can play with Headlock checked or unchecked. Headlock checked, the patient is instructed to keep their head on the green circle. As the target lights up, they are to use their eyes to fixate on the object then touch it.

### Settings

#### Difficulty Mode

Easy - Medium - Hard - Master - Custom

The amount of targets rendered will rely on settings.

### Headlock

Large size makes the activity easier. Medium is moderate difficulty. Small is high difficulty.

## Week 11 - to end

Choose from Breaker, Ring Runner, Hoopie, or Pepper Picker

Start with two of the games to work on anti-suppression.

Continue with Bubbles and Turbo after the two above activities

Include Step Vergence Activity/Barnyard Bounce

## Step Vergence

### Settings

#### Direction

Select **BI** for divergence or **BO** for convergence

### Starting Point

Begin activity at selected starting vergence demand, either at 0/ortho or at a chosen vergence demand

**Vergence Limit**

Set the limit for ending vergence demand

**Step Size**

0.5 for easy difficulty. Increasing the step size in diopters will increase the difficulty

**Activity Length**

Increase total time to encourage stamina of binocular fusion

**Answer Time Limit**

As the patient improves, add a time limit to work on automaticity

## Barnyard Bounce

**Settings****Direction**

Select **BI** for divergence or **BO** for convergence

**Difficulty Mode**

Easy - Medium - Hard - Master - Custom

This will set the jumping platforms at various levels of difficulty

**Starting Vergence**

Begin game at selected starting vergence demand

**Ending Vergence**

Set the limit for ending vergence demand

**Step Size**

0.5 for easy difficulty. Increasing the step size in diopters will increase the difficulty

**Activity Length**

Increase total time to encourage stamina of binocular fusion

## Near End - Introduce Jump Duction Activity

Work on fusional reserves with the Jump Duction activity. Jump Duction is more challenging than the Vergence activity, the patient is going back to orthophoria before increasing the vergence demand. The overall game goal is to have the patient reach greater than 30 prism diopters on base-out and 25 prism diopters on base-in.

## Jump Duction

**Settings****Direction**

Select **BI** for divergence or **BO** for convergence. **BI/BO** is the more advance level

**Starting Point**

Begin activity at selected starting vergence demand

**Vergence Limit**

Set the limit for ending vergence demand

**Step Size**

0.5 for easy difficulty. Increasing the step size will increase the difficulty



## Sports Vision Curriculum

Assists with eye hand coordination, reaction time and awareness and/or spatial integration.

### Week 1 - 2

#### Eye Hand Coordination

Increasing eye hand coordination is essential to efficient Sports Vision Therapy. The following may contain previous or listed exercises for in office or home therapy programs.

- Tootie toss

#### Reaction Time

The following may contain previous or listed exercises for in office or home therapy programs.

- Tootie Toss, SVI, Wayne Saccadic Fixator, Brock String

#### Spatial Integration

The following may contain previous or listed exercises for in office or home therapy programs.

- Wayne Saccadic Fixator, Dissociated Prism - Marsden Ball Bunting, Yoked Prism Walk

### Introduce Turbo

#### Turbo - Saccades

Work on saccadic eye movements by playing the Turbo game. The patient can play with Headlock checked or unchecked. Headlock checked, the patient is instructed to keep their head on the green circle. As the target lights up, they are to use their eyes to fixate on the object then touch it.

## **Settings**

### **Difficulty Mode**

**Easy - Medium - Hard - Master - Custom**

The amount of targets rendered will rely on settings.

### **Headlock**

Enable headlock. Large size makes the activity easier. Medium is moderate difficulty. Small is high difficulty.

### **Target Size Custom Difficulty only**

Size 5.0 is easy difficulty. Decrease the size of the target to make it more challenging.

### **Target Spread Custom Difficulty only**

This is the degree that the targets will spread into the peripheral field. 50 degrees is easy difficulty. 60 degrees is moderate difficulty. 70 degrees is high difficulty. Going above 70 degrees may cause the objects to appear outside of the patient's peripheral vision in the headset.

### **Quadrants Custom Difficulty only**

Localizing various visual quadrant areas - Left, Right, Upper and Lower quadrants to optimize various areas of gaze in specific sports play

## **Week 3 - 8**

### **Eye-Hand Coordination**

Increasing eye-hand coordination is essential to efficient Sports Vision Therapy. The following may contain previous or listed exercises for in office or home therapy programs.

- Tootie toss, Brock String

### **Reaction Time**

The following may contain previous or listed exercises for in office or home therapy programs.

- Tootie Toss, SVI, Wayne Saccadic Fixator

### **Spatial Integration**

The following may contain previous or listed exercises for in office or home therapy programs.

- Wayne Space Fixator, Dissociated Prism - Marsden Ball Bunting, Yoked Prism Walk

## Continue Turbo Game

### Turbo - Saccades

#### Settings

##### Difficulty Mode

Easy - Medium - Hard - Master - Custom

The amount of targets rendered will rely on settings

#### Headlock

Enable headlock. Large size makes the activity easier. Medium is moderate difficulty. Small is high difficulty.

#### Target Size Custom Difficulty only

Size 5.0 is easy difficulty. Decrease the size of the target to make it more challenging.

#### Target Spread Custom Difficulty only

This is the degree that the targets will spread into the peripheral field. 50 degrees is easy difficulty. 60 degrees is moderate difficulty. 70 degrees is high difficulty. Going above 70 degrees may cause the objects to appear outside of the patient's peripheral vision in the headset.

#### Quadrants Custom Difficulty only

Localizing various visual quadrant areas - Left, Right, Upper and Lower quadrants to optimize various areas of gaze in specific sports play.

### Turbo - Peripheral Vision

Work on the peripheral vision by playing the Turbo game. The patient can play with Headlock checked or unchecked. Headlock checked, the patient is instructed to keep their head on the green circle. As the target lights up, they are to use their eyes to fixate on the object then touch it.

#### Settings

##### Difficulty Mode

Easy - Medium - Hard - Master - Custom

The amount of targets rendered will rely on settings.

#### Headlock

Enable headlock. Large size makes the activity easier. Medium is moderate difficulty. Small is high difficulty

#### Target Size Custom Difficulty only

Size 5.0 is easy difficulty. Decrease the size of the target to make it more challenging



### **Quadrants Custom Difficulty only**

Localizing various visual quadrant areas - Left, Right, Upper and Lower quadrants to optimize various areas of gaze in specific sports play.

## **Turbo - Sequential Memory**

Work on sequential memory by playing the Turbo game. The patient can play with Headlock checked or unchecked. Headlock checked, the patient is instructed to keep their head on the green circle. As the target lights up, they are to use their eyes to fixate on the object then touch it.

### **Settings**

#### **Difficulty Mode**

**Easy - Medium - Hard - Master - Custom**

The amount of targets rendered will rely on settings.

### **Headlock**

Enable headlock. Large size makes the activity easier. Medium is moderate difficulty. Small is high difficulty

### **Target Size Custom Difficulty only**

Size 5.0 is easy difficulty. Decrease the size of the target to make it more challenging

### **Quadrants Custom Difficulty only**

Localizing various visual quadrant areas - Left, Right, Upper and Lower quadrants to optimize various areas of gaze in specific sports play.

## **Turbo - Stereo Mode**

Work on fine tuning stereoacuity by playing the Turbo game. The patient can play with Headlock checked or unchecked. Headlock checked, the patient is instructed to keep their head on the green circle. As the target lights up, they are to use their eyes to fixate on the object then touch it. This lit target will have a regressed or popping out appearance to the patient.

### **Settings**

#### **Difficulty Mode**

**Easy - Medium - Hard - Master - Custom**

The amount of targets rendered will rely on settings.

### **Headlock**

Enable headlock. Large size makes the activity easier. Medium is moderate difficulty. Small is high difficulty

#### **Target Size Custom Difficulty only**

Size 5.0 is easy difficulty. Decrease the size of the target to make it more challenging

#### **Quadrants - Custom Difficulty only**

Localizing various visual quadrant areas - Left, Right, Upper and Lower quadrants to optimize various areas of gaze in specific sports play.

## **COMMON TERMS**

### **Suppression**

Vivid Vision game play creates an MFBF environment in virtual reality assisting the user to break suppression through various game play settings. Methods used to encourage and stimulate simultaneous perception are accomplished by changing the size of the object in play seen by the amblyopic eye, adjusting for intraocular contrast, or applying a virtual blur patch to the dominant eye. The angle of deviation in the strabismic eye is met in game play by moving the imagery of the object to the users angle of deviation, therefore enabling bifoveal fixation and fusion at that users angle.

### **Motor Fusion**

Motor fusion is the ability to align the eyes in such a manner that sensory fusion can be maintained. It is the mechanism that allows fine-tuning of eye position to maintain eye alignment - this is known as fusional vergence. By initializing therapy in virtual reality first, brain to eye connections are made and can be applied more readily to real life reality experiences.

### **Perceptual Learning**

Vivid Vision games and activities provide a process of introducing stimuli through various methods, such as visual and proprioceptive, to encourage the user to be engaged in the tasks. Through practice, the user will continuously improve their visual skills.

## **BINOCULAR VISION DISORDERS**

### **Amblyopia**

Amblyopia, commonly known as lazy eye, is an eye condition noted by a reduced vision in the less dominant eye not correctable by glasses or contact lenses or not due to any eye disease.

## Strabismus

Strabismus, commonly known as crossed eye, occurs when the eyes are not straight. One eye may turn in, out, up or down. When this happens, the brain begins to ignore, or “turns off” the eye that is not straight and the vision may subsequently drop in that eye.

## Vergence Disorders

Vergence disorders are a sensory and neuromuscular anomaly of the binocular vision system, characterized by a reduced ability of the eyes to turn towards or away from each other.

Convergence Insufficiency is anomaly of the binocular vision system, characterized by a tendency for the eyes to **under** converge at near.

Convergence Excess is anomaly of the binocular vision system, characterized by a tendency for the eyes to **over** converge at near.

## Oculomotor Dysfunction

A sensorimotor anomaly of the ocular motor system where the characteristic feature is the inability to perform accurate and effective ocular pursuits, saccades, and fixations.